## WHAT IS CLAIMED IS:

- 1 1. A probe needle for testing semiconductor chips, the probe needle comprising:
- 2 an elongated member; and
- a contact tip attached at one end of the elongated member, wherein at least a portion of
- 4 the surface of the contact tip is provided with a coating of a chemically inert, electrically
- 5 conductive material that is hard relative to the material of surfaces of the semiconductor chips to
- 6 be contacted.
- 1 2. The probe needle according to claim 1 wherein the elongated member includes a fixed
- 2 end and a free end and wherein the contact member is attached at the free end.
- 1 3. The probe needle according to claim 1 wherein the entire surface of the contact tip is
- 2 provided with the coating.
- 1 4. The probe needle according to claim 3 wherein the entire surface of the probe needle is
- 2 provided with the coating.
- 1 5. The probe needle according to claim 1 wherein the coating comprises titanium nitride.
- 1 6. The probe needle according to claim 5 and further comprising an adhesive layer of
- 2 titanium arranged beneath the titanium nitride layer so that the adhesive layer is between the
- 3 surface of the contact tip and the titanium nitride layer.

- 1 7. A method for manufacturing a probe needle for testing semiconductor chips, the method
- 2 comprising:
- 3 providing a probe needle that includes a contact tip; and
- 4 coating the probe needle at least in the area of the contact tip with a chemically inert,
- 5 electrically conductive material that is hard relative to the material of the contact surfaces of the
- 6 semiconductor chips to be contacted.
- 1 8. The method according to claim 7 wherein the coating the probe needle at least in the area
- 2 of the contact tip comprises completely coating the probe needle.
- 1 9. The method according to claim 7 wherein the coating comprises coating with titanium
- 2 nitride.
- 1 10. The method according to claim 9 and further comprising coating at least in the area of the
- 2 contact tip with a titanium layer prior to the coating with titanium nitride.
- 1 11. The method according to claim 10 wherein the coating with titanium and titanium nitride
- 2 takes place in situ.
- 1 12. The method according to claim 9 wherein the probe needle is coated using a physical
- 2 vapor deposition (PVD) method.
- 1 13. The method according to claim 12 wherein the PVD method comprises a reactive
- 2 magnetron sputtering method.

- 1 14. The method according to claim 12 wherein the coating takes place from a titanium target
- 2 with the addition of the reactive gases argon and nitrogen.
- 1 15. The method according to claim 9 wherein the titanium nitride comprises titanium nitride
- with a stoichiometric ratio of Ti:N = 1.

- 1 16. A method of forming a semiconductor device, the method comprising:
- 2 fabricating a semiconductor wafer to include a number of circuits and a number of pads;
- 3 contacting a test probe to at least one of the pads, the test probe including a contact tip
- 4 that is coated with a chemically inert, electrically conductive material that is hard relative to the
- 5 at least one pad; and
- 6 performing an electrical test by applying a test signal to the semiconductor wafer through
- 7 the test probe.
- 1 17. The method of claim 16 wherein the test probe includes a contact tip that is coated with
- 2 titanium nitride.
- 1 18. The method of claim 17 wherein the test probe includes a contact tip that is coated with a
- 2 layer of titanium and a layer of titanium nitride overlying the layer of titanium.
- 1 19. The method of claim 17 and further comprising, after performing an electrical test,
- 2 packaging the semiconductor device.
- 1 20. The method of claim 16 wherein the step of contacting a test probe is performed on an
- 2 individual semiconductor chip.